



# Nutrition for Gestational Diabetes: From *Positive* Screening to *Positive* Outcomes

*Patti Geil*  
MS, RD, FADA, CDE



# Nutrition for Gestational Diabetes: From *Positive* Screening to *Positive* Outcomes

## Objectives

At the completion of this presentation, the participant will be able to:

- Describe the goals of MNT for GDM
- Discuss the nutrient requirements for a woman with GDM
- Demonstrate the use of Nutrition Practice Guidelines in GDM using a case study format



# What is Gestational Diabetes?

- Carbohydrate intolerance of variable severity with onset or first recognition during pregnancy
- Progressive insulin resistance due to increased placental hormone secretion and weight gain, exceeding the capacity of the beta-cell to respond

# Complications Associated with GDM

## ■ Maternal

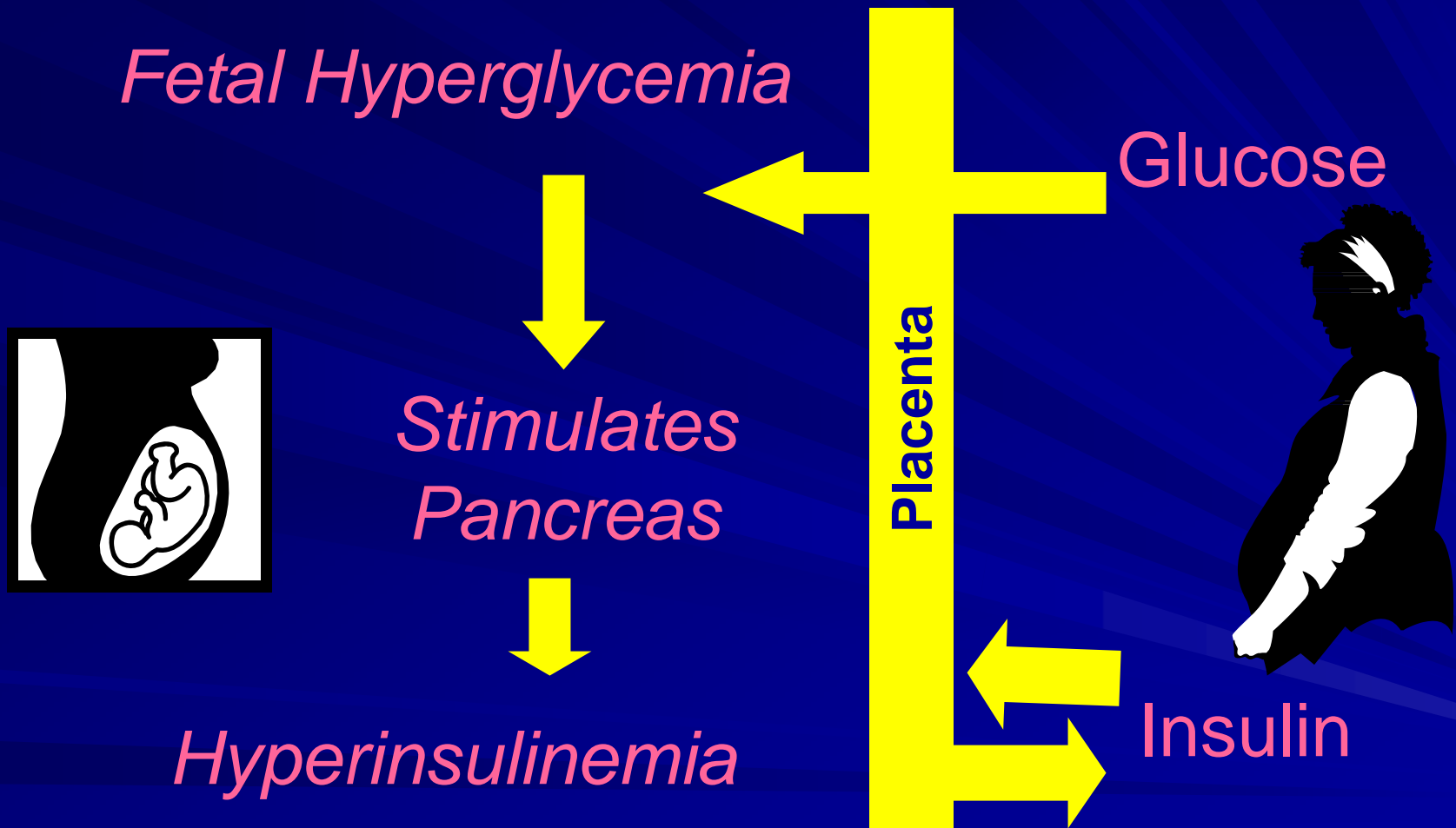
- Hypertension
- Polyhydramnios
- Preterm delivery
- Cesarean section



## ■ Fetal

- Macrosomia
- Preterm birth
- Hypoglycemia
- Hypocalcemia, hyperbilirubinemia
- Respiratory distress syndrome
- Increased rate of stillbirth

# Effect of Maternal Glucose on Fetus





Healthy eating

Being active

Monitoring

Taking medication

Problem-solving

Healthy coping

Reducing risks

# Self Care Behavior:

## *Healthy eating*



- Nutritional recommendations based on individual nutrition assessment
- Achieve and maintain normoglycemia
- Provide a nutritionally adequate diet for pregnancy



# Self Care Behavior:

## *Healthy eating*

- Achieve and maintain normoglycemia
- Consume adequate calories to promote appropriate gestational weight gain and avoid maternal ketosis
- Consume food providing nutrients necessary for maternal & fetal health
- Decrease pregnancy-related discomforts, such as hypoglycemia, nausea, vomiting, constipation & heartburn
- Ensure that GDM pregnancies result in the delivery of healthy babies without complications

# Institute of Medicine

## Nutrient Recommendations for Pregnancy

- Energy: additional 340-450 cal/day
- Carbohydrate: 175 grams/day
- Fiber: 28 grams/day
- Protein: 1.1 grams/kg/day
- Calcium: 1000 mg/day

*Institute of Medicine, Dietary Reference Intakes, 2005*

# Weight Gain During Pregnancy

■ Developing unborn baby	7.0- 8.0 lbs.
■ Placenta	1.5- 2.0 lbs.
■ Amniotic fluid	2.0- 2.5 lbs.
■ Increased uterine size	2.5- 3.0 lbs.
■ Breasts	2.0- 3.0 lbs.
■ Increased blood volume	3.0- 3.5 lbs.
■ Normal water retention	3.0- 3.5 lbs.
<b>TOTAL</b>	<b>21.0- 25.5 lbs.</b>

# Pregnancy Weight Gain: Goals

- Underweight (<90% DBW):  
28-40 lb
- 90-120% DBW:  
25-35 lb
- Overweight (>150% DBW):  
15-25 lb



Copyright 1997 Randy Glasbergen. www.glasbergen.com



**“Worst case of stretch marks I’ve ever seen!”**



# Optimal Pattern of Weight Gain

- First trimester
  - 2-5 lb
  - Increased blood volume and growth of uterus
- Second trimester
  - 0.5 to 1 lb per week
  - Changes to mother's body to support pregnancy
- Third trimester
  - 0.5 to 1 lb per week
  - Maximal growth of baby and placenta

# Self Care Behavior:

## *Healthy eating*

- Daily caloric intake based on pre-pregnancy weight status:
  - <90% DBW: 36-40 kcal/kg/day
  - DBW: 30 kcal/kg/day
  - 120-150% DBW: 24 kcal/kg/day
  - >150% DBW: 12-18 kcal/kg/day
- Composition of the diet:
  - 40-50% CHO, 20% pro, 30-40% fat

# Self Care Behavior:

## *Healthy eating*

- Caloric distribution to maintain normoglycemia based on clinical outcome measures:

<u>Meal</u>	<u>Calories (%)</u>
Breakfast	10-15
Snack	5-10
Lunch	20-30
Snack	5-10
Dinner	30-40
Snack	5-10

# Self Care Behavior:

## *Healthy eating*

- Carbohydrate counting
- Carbohydrate is the primary nutrient affecting blood glucose
- Distribute carbohydrate based on clinical outcome measures
- 3 small meals with 2-4 snacks
- Carbohydrate generally not well tolerated at breakfast
- Self blood glucose monitoring to evaluate/modify meal plan

# Self Care Behavior:

## *Monitoring*

- Blood glucose monitoring
  - At least four times daily (fasting and 1 or 2 hours post-prandial)
- Urinary ketone testing
  - Daily, fasting
- Review records of values weekly
  - Call in, fax back, email if not coming in that week
  - Bring in, if appointment scheduled
  - Patient accountability



# Sweeteners

- Acesulfame K, aspartame, neotame, saccharin and sucralose are approved by the FDA for use during pregnancy
- Saccharin crosses the placenta and may remain in fetal tissues
- Saccharin and Ace-K cross into breast milk
- Their effect on the infant is unknown



# Vitamins and Minerals



*Pregnant women at nutritional risk should take a daily multivitamin and mineral supplement containing:*

- Iron: 30 mg
- Zinc: 15 mg
- Copper: 2 mg
- Calcium: 250 mg
- Vitamin B-6: 2 mg
- Folate: 600 mcg
- Vitamin C: 50 mg
- Vitamin D: 5 mcg

*Institute of Medicine, Nutrition During Pregnancy, 1990*

# Herbal Supplements

- No controlled research studies to determine safety and efficacy in pregnancy

- Commonly used herbals may cause uterine stimulation, tachycardia, hypotension, preterm labor and intrauterine growth retardation



# 2000 Calorie Meal Plan

40% CHO, 23% PRO, 37% FAT

## ■ Breakfast

2 hard boiled eggs

½ cup cooked oatmeal

2 tsp. tub margarine

1 cup skim milk

## ■ Lunch

2 oz. white meat chicken

2 tsp. mayonnaise

2 slices wheat bread

½ cup cooked broccoli

17 small grapes

20 peanuts

1 cup skim milk

## ■ Mid-Morning Snack

¾ oz. pretzels

10 peanuts

## ■ Mid-Afternoon Snack

¼ large bagel

1 tsp. tub margarine

1 small apple

# 2000 Calorie Meal Plan

40% CHO, 23% PRO, 37% FAT

## ■ Supper

3 oz. ground beef patty  
1 cup cooked kale  
½ cup corn  
2 tsp. tub margarine  
1 cup skim milk

## ■ Bedtime Snack

¾ cup plain nonfat yogurt  
1 ¼ cup strawberries  
1 oz. cheddar cheese  
3 cashews



WELL, HERE'S THE ANSWER TO WHY  
YOUR CAR HAS BEEN RUNNING SO  
ROUGH IN THE MORNINGS Mr. TAIT....  
IT'S PREGNANT!



© Original Artist  
Reproduction rights obtainable from  
[www.CartoonStock.com](http://www.CartoonStock.com)

# Pregnancy Precautions



- *Caffeine-*  
*Limit to less than 300 mg/d*



- *Alcohol*
- *Smoking*
- *Recreational Drugs*

# Pregnancy Precautions

- Mercury
- PCBs
- Bacteria
- Food Preparation



Copyright 2005 by Randy Glasbergen.  
[www.glasbergen.com](http://www.glasbergen.com)



**“WORMS?! Haven’t you read any literature  
on the benefits of breast feeding?”**

# Breast Feeding

- Breast feeding is recommended for women with GDM
- Exclusive breast feeding may protect against Type 2 diabetes in the offspring of women with GDM
- Breast feeding may reduce the risk of Type 2 diabetes in mothers by improving glucose homeostasis

# off the mark

by Mark Parisi

www.offthemark.com

TODAY I PUT IN A  
FLOWER BED, SEWED  
CURTAINS FOR THE  
BEDROOM, MADE MY  
HALLOWEEN COSTUME,  
HAD LUNCH, DID ALL  
MY HOLIDAY SHOPPING,  
LEARNED A NEW  
COMPUTER LANGUAGE,  
PUT UP A SHELF, AND  
COOKED A GOURMET  
DINNER...

MARK PARISI

BEFORE

TODAY  
I ALMOST  
FINISHED  
LUNCH...

AFTER

ATLANTIC FEATURE SYND. © 1994 MARK PARISI www.offthemark.com



# Nutrition Practice Guidelines

- Defined as “a protocol or clinical practice guideline that has been validated by clinical testing to evaluate its effectiveness”
- NPGs provide a framework for the process of providing MNT for diabetes
- Three NPGs validated for diabetes: T1, T2 and GDM

# Nutrition Practice Guidelines

## Research validation for T1 and T2 NPGs

- A1C decreased a significant 1% to 2% when RDs followed NPGs
- Cost-effectiveness enhanced in T2

## Research validation for GDM NPGs

- Lowered frequency of insulin use and abnormal A1C at follow up for those provided with NPG care

# NPGs: The Process

- Assessment
- Goal setting and nutrition care plan
- Intervention
- Documentation and communication
- Evaluation and reassessment

# Nutrition-Focused Assessment

- Based on referral data:
  - medical history
  - medications
  - laboratory data
  - anthropometrics
- Comprehensive nutrition/physical activity history
- Psychosocial/lifestyle/economic issues

# Stages of Change

- Precontemplation
- Contemplation
- Preparation
- Action
- Maintenance





# Goal Setting

- Reasonable, attainable, measurable
- Short term goals vs. long term goals
- Client goals vs. health care team goals
- Mutually agreed upon by client and caregiver



# Establish the Nutrition Care Plan

## ■ ADA Resources:

First Step

Healthy Food Choices

Eating Healthy with Diabetes

Exchange Lists for Meal Planning

Carbohydrate Counting

# Intervention

- The diabetes educator's activities that facilitate or support the client's diabetes nutrition self-management plan
- Strategies may change as client's understanding of diabetes and motivation to self-manage evolve



# Documentation and Communication

- Nutrition progress notes in medical record
- Valuable to referral source and other health care team members
- Document clinical and behavioral goals, nutrition prescription, meal planning approach, educational topics covered, client acceptance and understanding

# Evaluation and Reassessment

- Measurable goals make evaluation a straightforward task
- If goals not met, change or renegotiate
- If goals are met, set new goals appropriate for current circumstances



*Managing  
Gestational  
Diabetes Mellitus:  
A Case Study*

# Assessment

- Hispanic female, twenty-fifth week of second pregnancy
- 66 inches
- Currently 185#, pre-pregnancy weight 175#
- BMI= 28
- 31 years of age



# Assessment

- Family history of type 2 diabetes mellitus
- Results of 50 g glucose challenge test: BG 155 mg/dl 1 hr post glucose load
- Results of 100 g OGTT:
  - Fasting: 90 mg/dl
  - 1 hour: 230 mg/dl
  - 2 hour: 168 mg/dl
  - 3 hour: 136 mg/dl
- Additional laboratory values are within normal range for pregnancy

# Assessment

- Married, three-year-old son, works full time
- No cigarettes or alcohol
- Medication: prenatal vitamin
- No regular program of physical activity

# Assessment

- 3500 calories with 425 grams of CHO
- Eating frequently to prevent nausea
- Breakfast: sweetened cereal, skim milk, fruit juice and a sweet roll
- Lunch: fast food “value meal” with a regular soft drink
- Snack: chips or popcorn from the office vending machines
- Supper: casserole-type dish served with a salad, bread and dessert
- Bedtime snack: large bowl of ice cream

# What Do You Think?

- List three goals that would be reasonable for this client.
- What should be included in the nutrition care plan for this client?
- What nutrition education resources would you use for this client?
- How would you document an encounter with this client?
- How soon would you set a follow-up appointment for this client? What would you evaluate on the return visit?

# ***The Ultimate Outcome Measurement...***



*"Easy answers for all your questions about how to  
have a healthy pregnancy with diabetes."*

*—Lisa Jovanovic, MD*



# 101 Tips™ for a Healthy Pregnancy with Diabetes

Patti B. Geil, MS, RD, FADA, CDE

Laura D. Hieronymus, MEd, ADONLAC, ACN, CDE

**Planning for Success**  
**More than Just Eating for Two**  
**Managing Medications • Keep Moving**  
**Peace of Mind • Much More!**



# References

- American College of Obstetricians and Gynecologists: Exercise During Pregnancy and the Postpartum Period. *Obstetrics and Gynecology* 99:171, 2002.
- American Diabetes Association: Clinical Practice Recommendations. *Diabetes Care* 29(Suppl 1), 2006.
- American Diabetes Association: Position Statement- Gestational Diabetes Mellitus. *Diabetes Care* 27: s88-90, 2004.
- American Dietetic Association: *Guide to Gestational Diabetes Mellitus*, 2005.

# References

- Geil, PB., Hieronymus, LB. *101 Tips for a Healthy Pregnancy with Diabetes*. American Diabetes Association, 2003.
- Hieronymus LB., Geil PB. Expecting The Best: Diabetes, Pregnancy and Blood Glucose Control. *Diabetes Self-Management*, July/August 2001.
- Jovanovic, L. (editor in chief). Medical Management of Pregnancy Complicated by Diabetes. *American Diabetes Association*, 3<sup>rd</sup> ed, 2000.
- Sacks, SB. (editor). Sweet Success Guidelines for Care: State Program Guide. *Maternal & Child Health Branch, Department of Health Services State of California*, 2002.